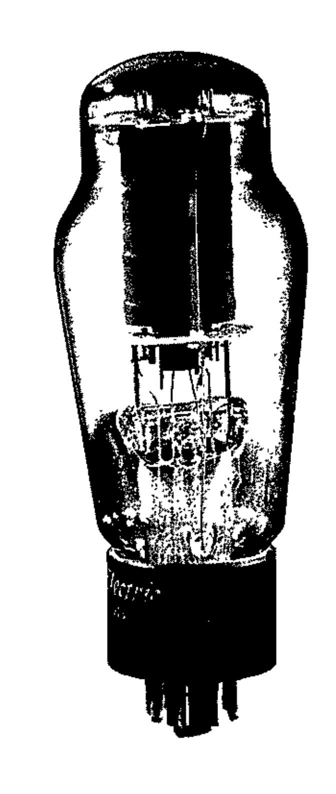
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S.D.H.
6/15/0



TETRODE
BEAM POWER AMPLIFIER

Western Electric

DESCRIPTION

The 350B is a beam power tetrode of the neater-cathode type. It is designed for use as an audio-frequency amplifier or as a radio-frequency oscillator.

CHARACTERISTICS

Heater Voltage		6.3 volts
Plate Current	$E_b = E_{c2} = 250$ volts; $E_{c1} = -14$ volts	93 milliamperes
Transconductance		8300 micromhos
Power Output		10.5 watts

350B
TETRODE

GENERAL CHARACTERISTICS

ELECTRICAL DATA

Heater Voltage, A-C or D-C	6.3 volts
Heater Current	1.6 amperes
Direct Interelectrode Capacitances (without external shield)	
Grid to Plate (maximum)	0.5 uuf
Input	16 uuf
Output	8 uuf

MECHANICAL DATA

Cathode	Coated Unipotential
Bulb	ST16
Base	Medium shell, 7-pin octal
Mounting Position	Any

MAXIMUM RATINGS, Design-Center Values

Plate Voltage	360 volts
Screen Grid Voltage	270 volts
Maximum Signal Plate Current	125 milliamperes
Plate Dissipation	27 watts
Screen Grid Dissipation	4 watts

Maximum Grid Circuit Resistance for	
Fixed Bias	0.1 megohm
Cathode Bias	0.5 megohm

TYPICAL OPERATING CONDITIONS AND CHARACTERISTICS

SINGLE TUBE AMPLIFIER — CLASS A_1

Plate Voltage	250	350	250	volts
Screen Grid Voltage	250	250	250	volts
Control Grid Voltage	−14	−18	...	volts
Cathode Resistor	...	...	130	ohms
Peak A-F Grid Voltage	14	18	14	volts
Zero Signal Plate Current	93	62	93	milliamperes
Maximum Signal Plate Current	97	81	89	milliamperes
Zero Signal Screen Grid Current	6.0	2.5	5.0	milliamperes
Maximum Signal Screen Grid Current	15	16	16	milliamperes
Transconductance	8300	7100	8500	micromhos
Plate Resistance	37500	57500	34500	ohms
Load Resistance	2000	3200	2500	ohms
Maximum Signal Power Output	10.5	15.8	9.6	per cent
Total Harmonic Distortion	11	18	11	per cent

SINGLE TUBE AMPLIFIER (TRIODE CONNECTIONS*)—CLASS A_1

Plate Voltage	250	250	volts
Control Grid Voltage	−20	...	volts
Cathode Resistor	...	350	ohms
Peak A-F Grid Voltage	20	20	volts
Zero Signal Plate Current	50	50	milliamperes
Maximum Signal Plate Current	56.0	52.2	milliamperes
Transconductance	6400	6800	micromhos
Amplification Factor	8	8	
Plate Resistance	1250	1180	ohms
Load Resistance	5000	6000	ohms
Maximum Signal Power Output	1.7	1.5	watts
Total Harmonic Distortion	5	3.6	per cent

PUSH-PULL AMPLIFIER—CLASS A_1

Unless otherwise specified, values are for 2 tubes

Plate Voltage	250	270	270	volts
Screen Grid Voltage	250	270	270	volts
Control Grid Voltage	−15	−17.5	...	volts
Cathode Resistor	...	...	75	ohms
Peak A-F Grid-to-Grid Voltage	30	35	32	volts
Zero Signal Plate Current	165	163	184	milliamperes
Maximum Signal Plate Current	203	212	196	milliamperes
Zero Signal Screen Grid Current	13	12	16	milliamperes
Maximum Signal Screen Grid Current	24	28	24	milliamperes
Transconductance	8200	8050	9500	micromhos
Plate Resistance	37500	50000	35500	ohms
Effective Load Resistance (Plate-to-Plate)	2000	2000	3000	ohms
Maximum Signal Power Output	15.5	20.0	18.6	watts
Total Harmonic Distortion	2.5	3.5	6.3	per cent

PUSH-PULL AMPLIFIER—CLASS AB_1

Unless otherwise specified, values are for 2 tubes

Plate Voltage	360	360	volts
Screen Grid Voltage	270	270	volts
Control Grid Voltage	−25	...	volts
Cathode Resistor	...	130	ohms
Peak A-F Grid-to-Grid Voltage	50	45	volts
Zero Signal Plate Current	68	132	milliamperes
Maximum Signal Plate Current	162	155	milliamperes
Zero Signal Screen Grid Current	2.5	5.5	milliamperes
Maximum Signal Screen Grid Current	24.5	18	milliamperes
Effective Load Resistance (Plate-to-Plate)	3000	5000	ohms
Maximum Signal Power Output	22	25	watts
Total Harmonic Distortion	5	14	per cent

*Screen grid connected to plate.

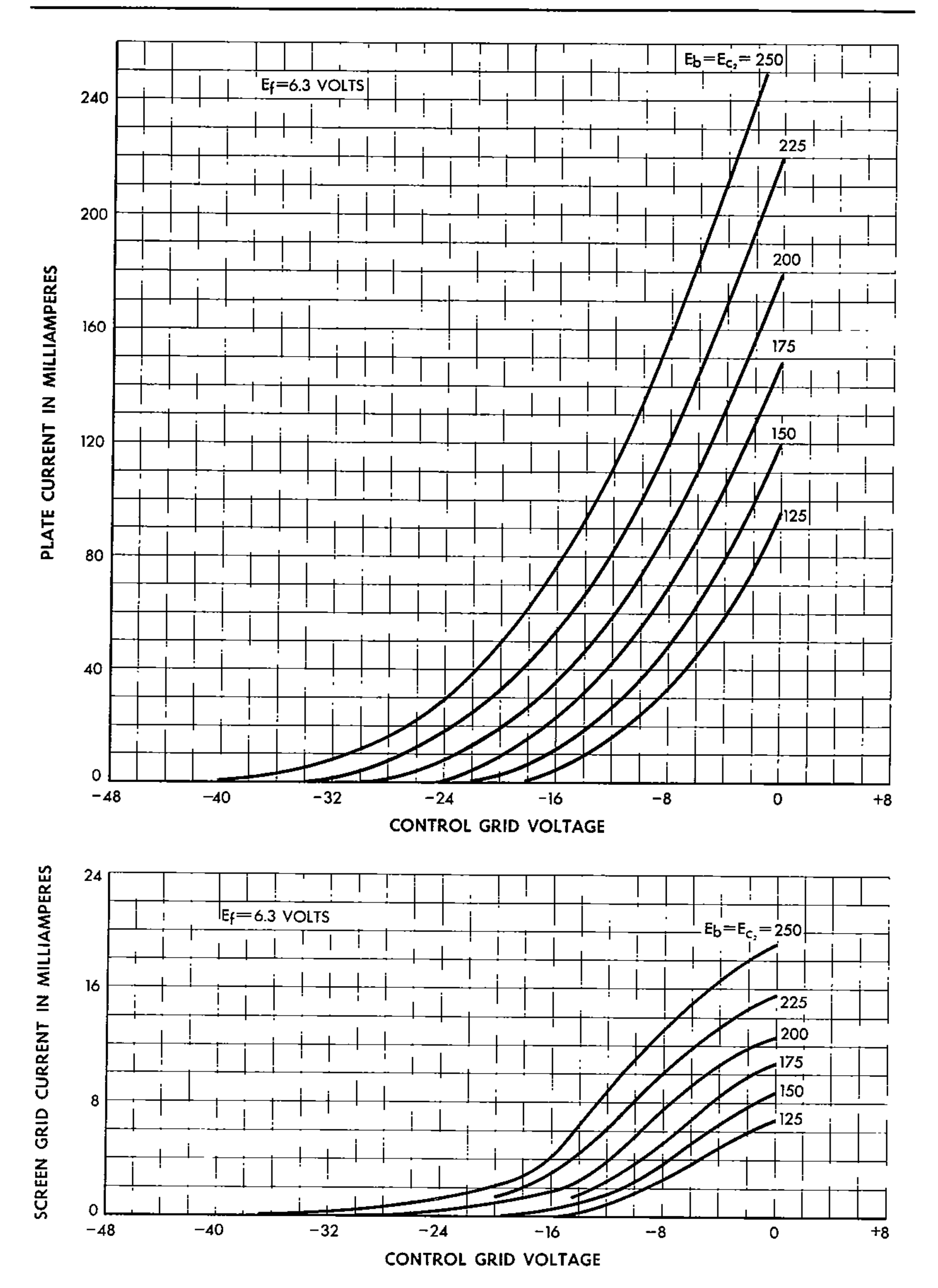
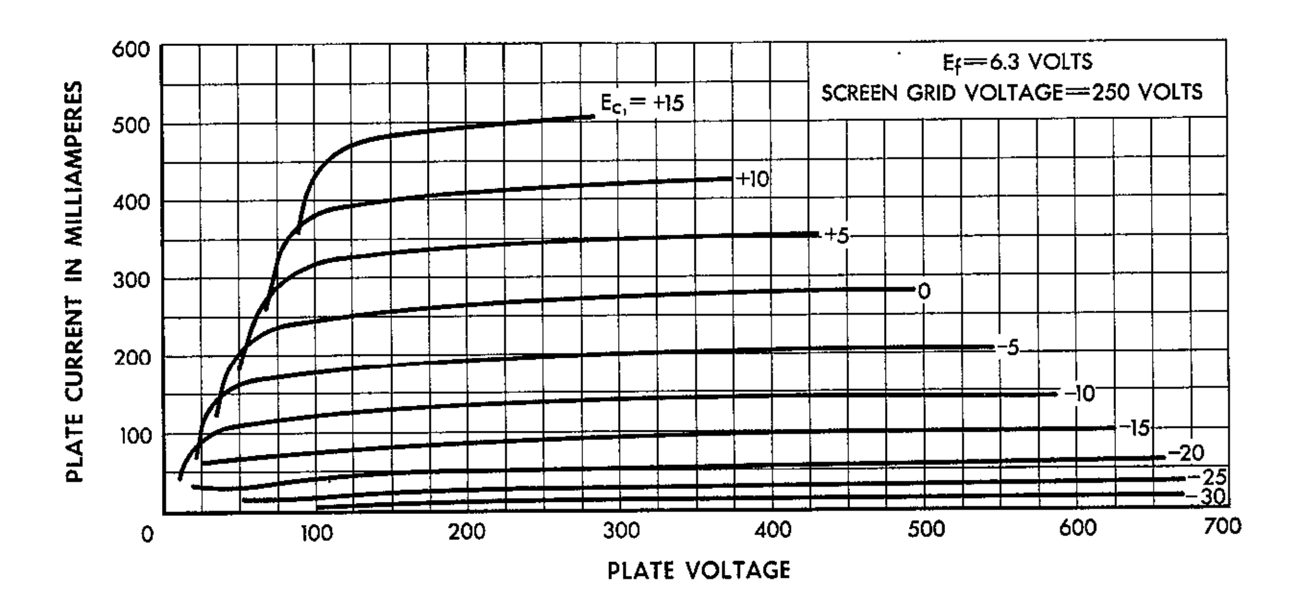
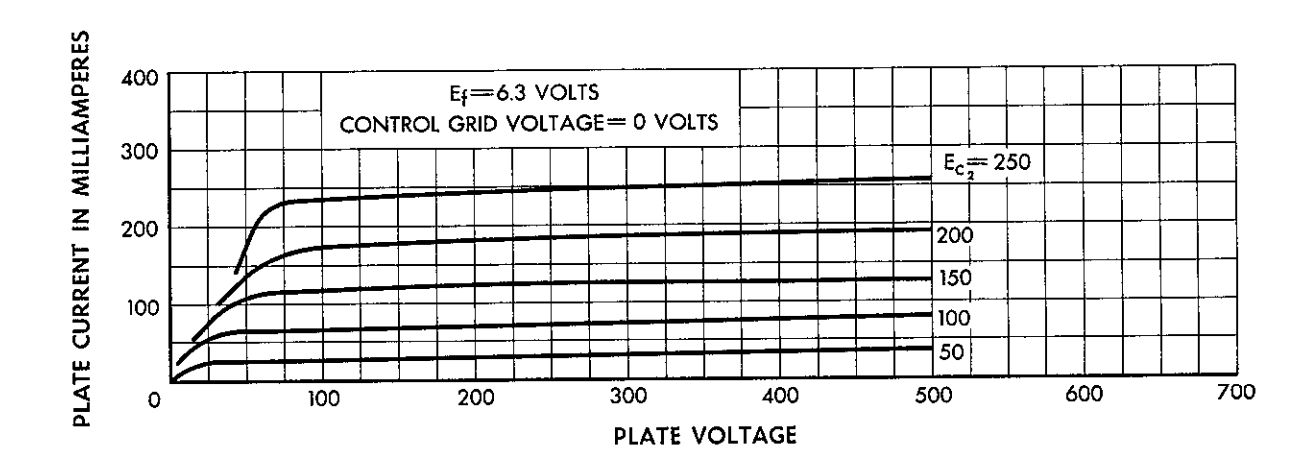
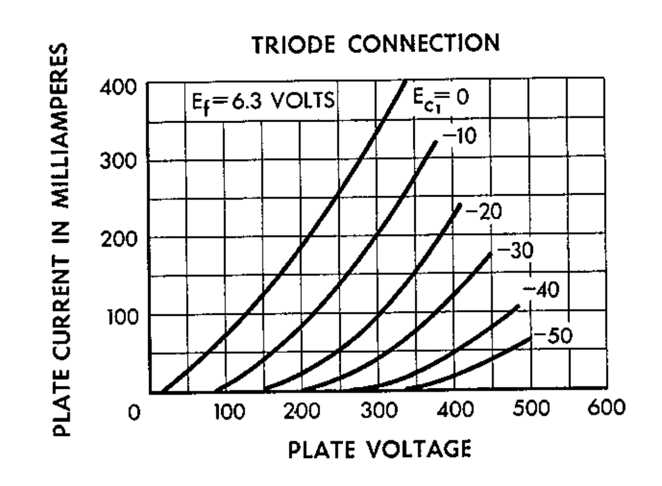
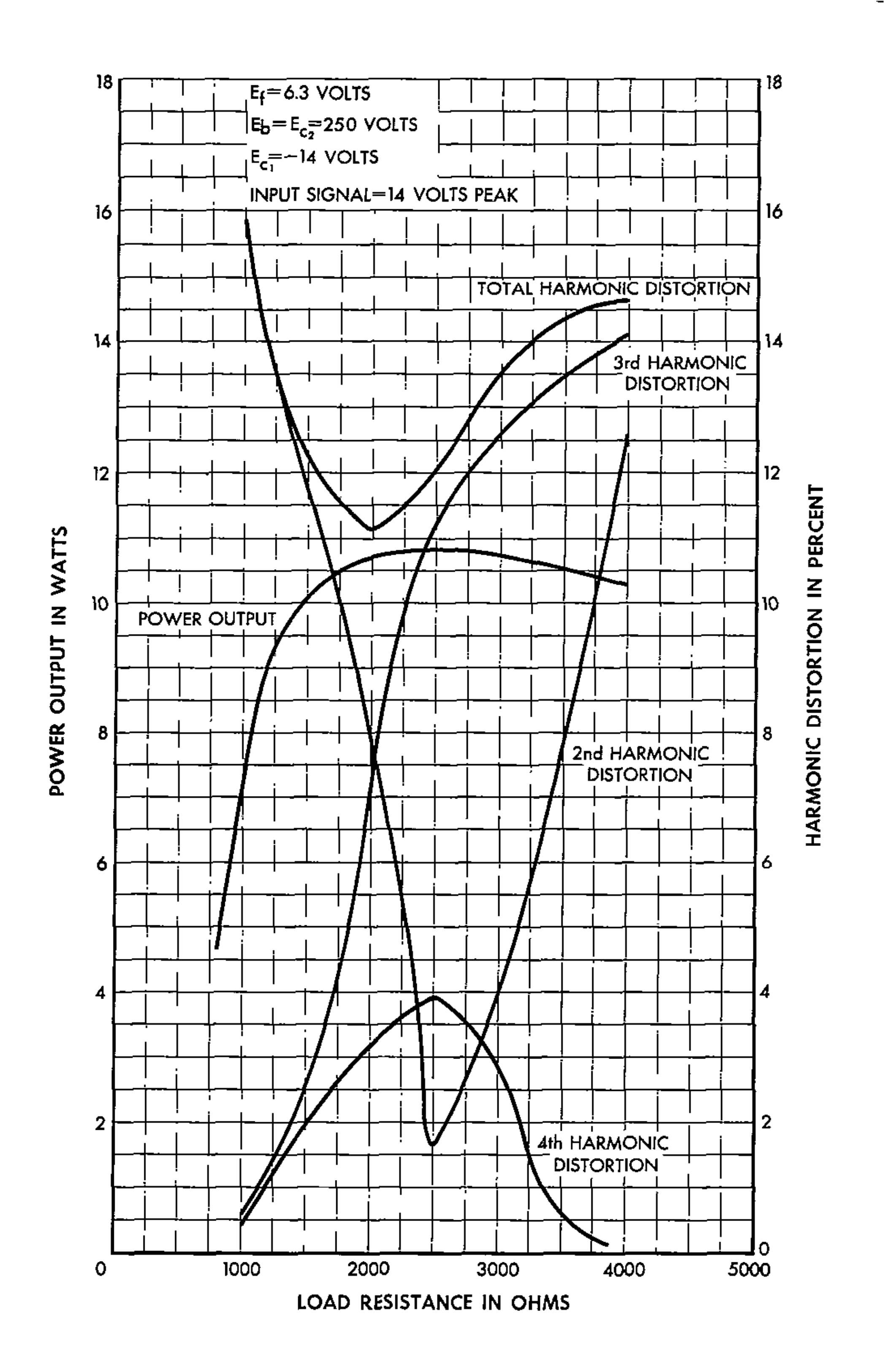


PLATE CURRENT IN MILLIAMPERES
E_f=6.3 VOLTS
$E_b = E_{c_2}$ = 250
225
200
175
150
125
240
200
160
120
80
40
0
−48
−40
−32
−24
−16
−8
0
+8
CONTROL GRID VOLTAGE
SCREEN GRID CURRENT IN MILLIAMPERES
E_f=6.3 VOLTS
$E_b = E_{c_2}$ = 250
225
200
175
150
125
24
16
8
0
−48
−40
−32
−24
−16
−8
0
+8
CONTROL GRID VOLTAGE

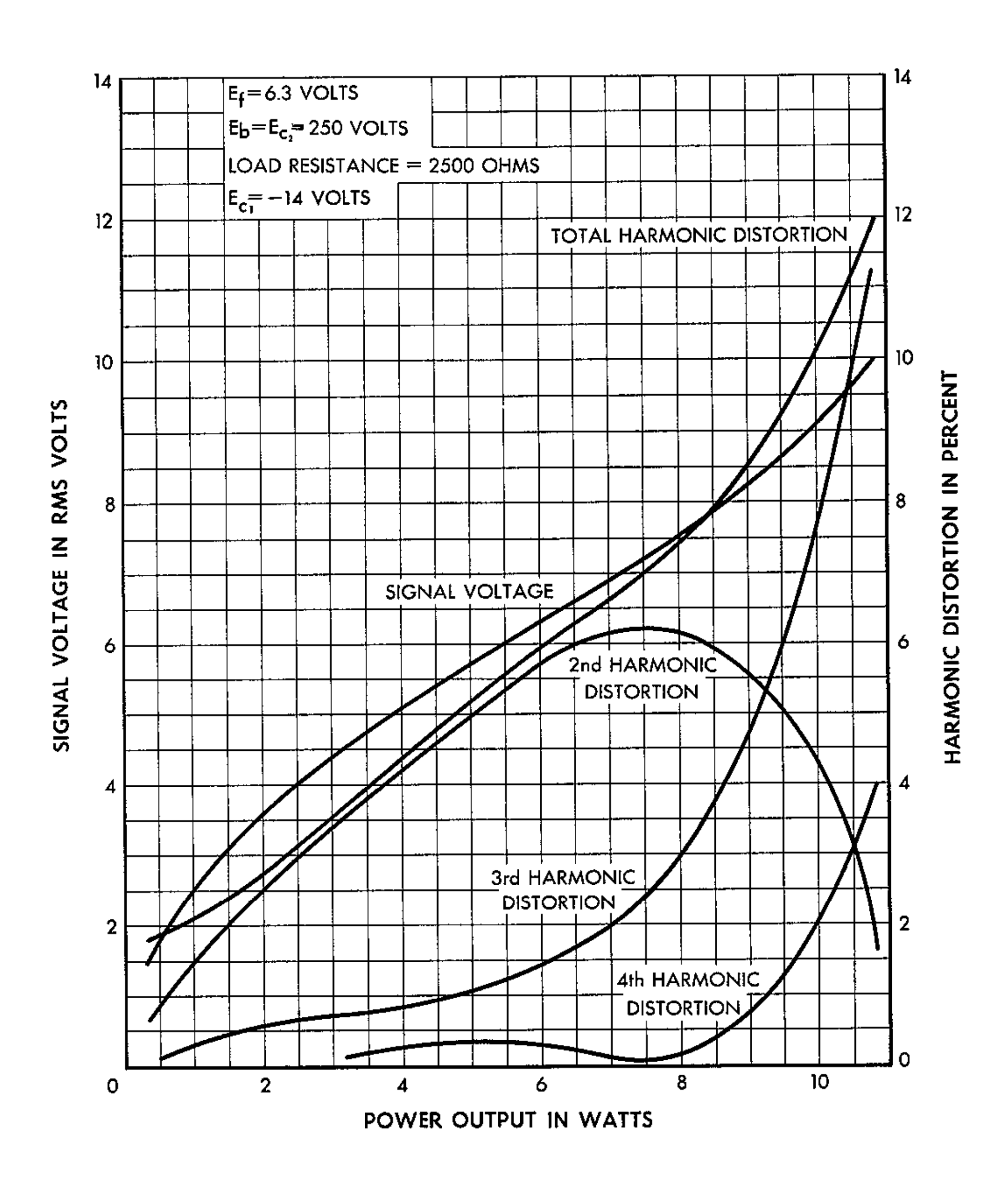

Ef=6.3 VOLTS
SCREEN GRID VOLTAGE=250 VOLTS
Ec1= +15
+10
+5
0
-5
-10
-15
-20
-25
-30
PLATE CURRENT IN MILLIAMPERES
PLATE VOLTAGE
0 100 200 300 400 500 600 700
600 500 400 300 200 100


Ef=6.3 VOLTS
CONTROL GRID VOLTAGE= 0 VOLTS
Ec2= 250
200
150
100
50
PLATE CURRENT IN MILLIAMPERES
PLATE VOLTAGE
0 100 200 300 400 500 600 700
400 300 200 100

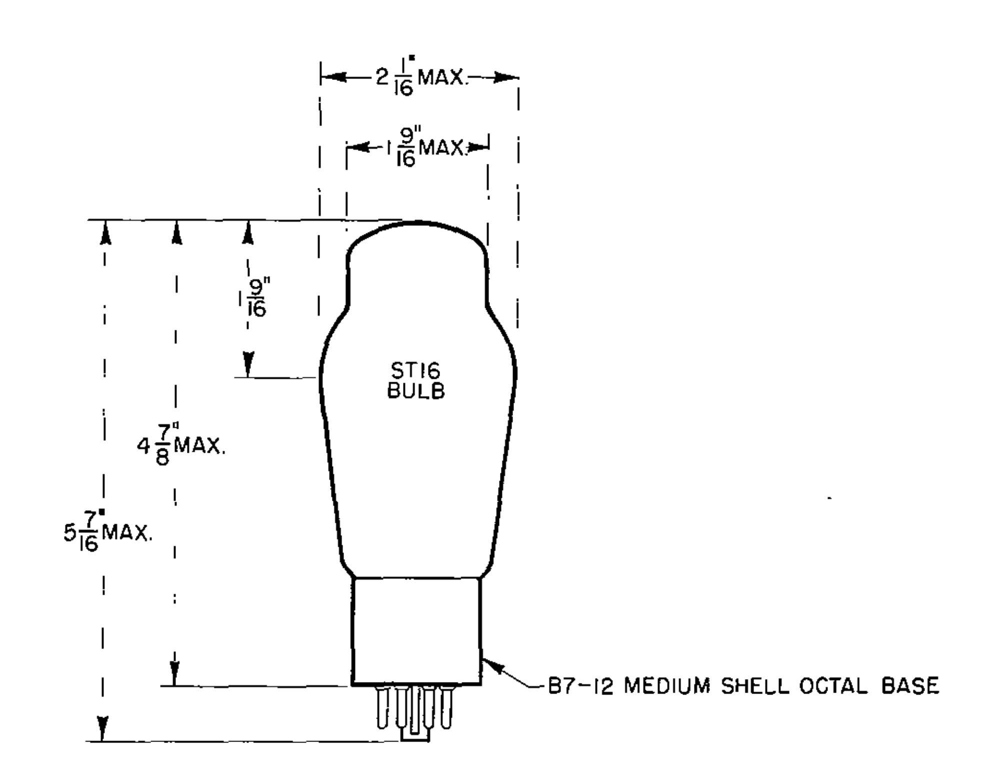

TRIODE CONNECTION
Ef=6.3 VOLTS
Ec1= 0
-10
-20
-30
-40
-50
PLATE CURRENT IN MILLIAMPERES
PLATE VOLTAGE
0 100 200 300 400 500 600
400 300 200 100

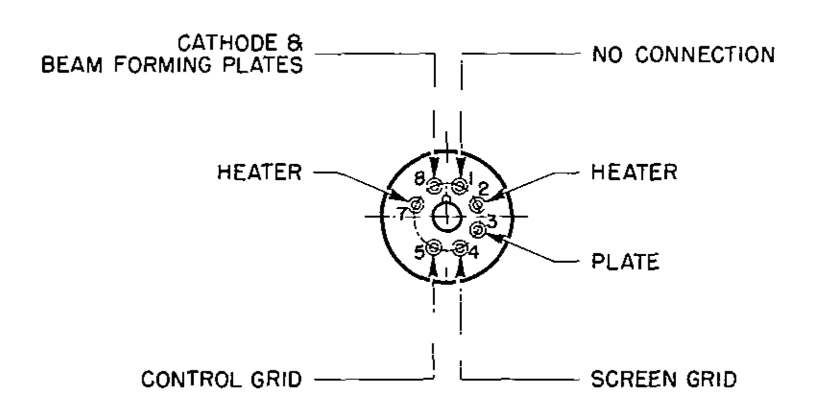


E_f=6.3 VOLTS
$E_b=E_{c_2}$=250 VOLTS
E_{c_1}=−14 VOLTS
INPUT SIGNAL=14 VOLTS PEAK
TOTAL HARMONIC DISTORTION
3rd HARMONIC DISTORTION
POWER OUTPUT
2nd HARMONIC DISTORTION
4th HARMONIC DISTORTION
POWER OUTPUT IN WATTS
HARMONIC DISTORTION IN PERCENT
LOAD RESISTANCE IN OHMS
0
1000
2000
3000
4000
5000
2
4
6
8
10
12
14
16
18



E_f = 6.3 VOLTS
$E_b = E_{c_2}$ = 250 VOLTS
LOAD RESISTANCE = 2500 OHMS
E_{c_1} = −14 VOLTS
TOTAL HARMONIC DISTORTION
SIGNAL VOLTAGE
2nd HARMONIC DISTORTION
3rd HARMONIC DISTORTION
4th HARMONIC DISTORTION
SIGNAL VOLTAGE IN RMS VOLTS
HARMONIC DISTORTION IN PERCENT
POWER OUTPUT IN WATTS
0
2
4
6
8
10
12
14





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A development of Bell Telephone Laboratories, the research laboratories of the American Telephone and Telegraph Company and the Western Electric Company.

1-D-50-4 PRINTED IN U. S. A. T-2648